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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,224	04/26/2006	Yoshitaka Mizutani	21398-00037-US1	3417

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CONNOLLY BOVE LODGE & HUTZ LLP
1875 EYE STREET, N.W.
SUITE 1100
WASHINGTON, DC 20006

EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,224	Applicant(s) MIZUTANI ET AL.	
	Examiner KAJ K. OLSEN	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 6-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/2/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group I, claims 1-5 in the reply filed on 6/11/2009 is acknowledged. The traversal is on the ground(s) that all the claims share the same special technical feature of an electrochemical gas sensor comprising a permeable membrane through which gas travels to be measured. It is unclear how applicant construes this to be a special technical feature when applicant has already admitted that such a sensor is old in the art (specification, p. 1, ll. 11-18). When the shared technical feature common to all the claims is known in the art (as evidenced by both the applicant's own specification as well as by the primary teachings in the rejections below), then unity of invention would be lacking between different groups of these claims. See section 10.37 (example 17) from the PCT International Search and Preliminary Examination Guidelines available from wipo.int/pct/en/texts/gdlines.htm. Applicant further urges that claim 7 of group II requires the same technical feature of group I of the invention. However because claim 7 is not an independent claim, it is unclear the relevance of this point. The independent claim of group II (claim 6) does not require this feature of claim 7 so claim 7 is not a special technical feature of group II. Applicant's assertion that claim 7 should be included with group I doesn't make any sense. Claim 7 doesn't depend from any claims of group I, so claim 7 cannot be examined with group I.

The requirement is still deemed proper and is therefore made FINAL.

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2. Claims 6-8 are withdrawn from further consideration as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2003-149194 (hereafter "JP '194") in view of JP 62-156285 (hereafter "JP '285"). For JP '194, the examiner will rely on the provided machine translation. The examiner has ordered a manual translation of JP '285, which should be available prior to the next office action.

6. With respect to claim 1, JP '194 discloses an electrochemical gas sensor that draws a gas to be measured into an electrolyte solution through a permeable membrane 31 and measures a concentration of said gas to be measured by an electrolyte current that flows between an

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electrode catalyst layer 40 formed on one side of the permeable membrane 31 and a counter electrode 35. See fig. 1 and par. 0004 and 0012. JP '194 does not explicitly disclose the use of a permeable membrane formed in the claimed manner. JP '285 discloses an alternate gas diffusion electrode where the permeable membrane is constructed out of a mixture of carbon black and a fluorine polymer (PTFE), where the catalytic layer 5 is formed on the side of the permeable membrane. JP '285 further discloses that such a membrane has high strength and is not prone to cracking or deformation. Moreover, the gas diffusion electrode of JP '285 has its catalytic layer impregnated into one side of the membrane thereby presumably providing strong contact between the membrane and the catalytic layer. See the abstract and fig. 2(c) and 2(d). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of JP '285 for the sensor of JP '194 so as to provide a high strength gas diffusion electrode that is free from cracking and deformation. With respect to the PTFE being in the form of a resin powder, a powdered form of the polymer would be an obvious form of starting material to utilize such that the carbon black and polymer could be thoroughly mixed together.

7. With respect to claim 2, see par. 0008 of JP '194.

8. With respect to claim 3, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. The examiner sees no evidence in the specification of the present invention these various sensors for different gases are being constructed in any different manners.

9. With respect to claim 4, see par. 0007 of JP '194.

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10. With respect to claim 5, finding the appropriate concentration of sulfuric acid to provide the desired electrolyte properties requires only routine skill in the art.

11. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya (USP 4,882,031) in view of JP '285.

12. Furuya discloses an electrochemical gas sensor that drawn a gas to be measured into an electrolyte 5 through a permeable membrane 1 and measures the concentration of said gas by an electrolytic current that flows between a catalyst and a counter electrode 4. Furuya constructs its membrane from a mixture of carbon black and fluorine polymer (PTFE). See fig. 2; col. 1, ll. 38-57; and col. 2, l. 64 - col. 3, l. 14. Furuya does not explicitly disclose the use of a catalyst layer formed on one side of the permeable membrane. Rather Furuya incorporates its catalyst (Pt) throughout the permeable membrane. However, JP '285 which is drawn to the same assignee with overlapping inventorship to Furuya, teaches that the catalyst for the sensor can also be incorporated into one side of the membrane as well. See the discussion of JP '285 above. Because JP '285 represents an alternate manner of constructing an appropriate gas diffusion electrode that was already known to the inventor of Furuya and also provides an electrode having high strength that is free from deformation, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of JP '285 for the electrode of Furuya because the substitution of one known electrode configuration for another requires only routine skill in the art. With respect to the PTFE being in the form of a resin powder, a powdered form of the polymer would be an obvious form of starting material to utilize such that the carbon black and polymer could be thoroughly mixed together.

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13. With respect to claims 2 and 3, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

14. Claim 3 in the alternative is rejected under 35 U.S.C. 103(a) as being unpatentable over either JP '194 or Furuya in view of JP '285 as applied to claim 1 above, and further in view of JP 2000-009681 A (hereafter "JP '681").

15. In the rejection of claim 3 above, the examiner took the position that the gas to be detected is just the intended use of sensor and doesn't further define the actual structure for the sensor. However, even if the examiner were to interpret claim 3 as actually requiring the measurement of NO₂, JP '681 teaches in alternate gas sensor where a sensor for one type of gas (phosphine) was either already capable of being utilized for the measurement of nitrogen oxides as well or was readily adaptable for such a measurement. See fig. 3 and 4. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to convert the sensor of JP '194 or Furuya into a nitrogen oxide sensor as well, as suggested by JP '681, so as to extend the utility of the gas sensor to other measurable gases.

16. Claims 4 and 5 (and claim 2 in the alternative) are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya in view of JP '285 as applied to claim 1 above, and further in view of JP '194.

17. With respect to claims 4 and 5, Furuya set forth all the limitations of the claims but did not explicitly disclose any particular electrolyte to be utilized for its sensor. The already discussed JP '194 teaches that sulfuric acid was a known electrolyte for gas sensing (par. 0007). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of JP '194 for the sensor of Furuya and JP '285 because the utility of

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one known form of electrolyte for the unspecified electrolyte of Furuya requires only routine skill in the art.

18. With respect to claim 5, finding the appropriate concentration of sulfuric acid to provide the desired electrolyte properties requires only routine skill in the art.

19. With respect to claim 2 in the alternative, the examiner took the position above that the gas to be detected is just the intended use of sensor and doesn't further define the actual structure for the sensor. However, even if the examiner were to interpret claim 2 as actually requiring the measurement of one of these gases, the earlier discussed JP '194 already suggested that phosphine sensors can be constructed for electrochemical measurement (par. 0008). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of JP '194 for the sensor of Furuya in view of JP '285 so as to extend the utility of its gas sensor to other art useful gases to be measured.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795

September 18, 2009